

E.3.1.1 Upgrade Alternative

This section contains the construction and operational waste volumes (Tables E.3.1.1-1 through E.3.1.1-4), and waste management block diagrams (Figures E.3.1.1-1 through E.3.1.1-3) for the facilities that would provide long-term (50 years) storage for weapons-usable fissile materials through the upgrading of existing storage facilities. Tables E.3.1.1-5 through E.3.1.1-9 reflect the incorporation of all or some of the material from the RFETS or Los Alamos National Laboratory in upgraded facilities.

Table E.3.1.1-1. Estimated Waste Volumes for the Upgrade Without Rocky Flats Environmental Technology Site Plutonium or Los Alamos National Laboratory Plutonium Subalternative at Hanford Site

Category	Annual Average Volume Generated From Construction (m ³)	Annual Volume Generated From Operations (m ³)	Annual Volume Effluent From Operations (m ³)
Transuranic			
Liquid	None	None	None
Solid	None	20	20
Mixed Transuranic			
Liquid	None	None	None
Solid	None	None	None
Low-Level			
Liquid	None	0.08 ^a	None
Solid	None	85	42 ^b
Mixed Low-Level			
Liquid	None	None	None
Solid	None	5	5
Hazardous			
Liquid	Included in solid	0.57	0.57
Solid	0.38	4	4
Nonhazardous (Sanitary)			
Liquid	3,880 ^c	8,330	None
Solid	21 ^d	917	459 ^b
Nonhazardous (Other)			
Liquid	Included in sanitary	Included in sanitary	None
Solid	Included in sanitary	None	None

^a Liquid LLW would be treated and solidified prior to disposal.

^b Assumes compaction of 4:1 for compactible solid LLW and nonhazardous waste.

^c Does not include groundwater dewatering, if required.

^d Includes concrete and 2.7 t of steel construction waste material that would be recycled as scrap metal.

Source: HF DOE 1996a.

Table E.3.1.1-2. Estimated Waste Volumes for the Upgrade Without Rocky Flats Environmental Technology Site Plutonium or Los Alamos National Laboratory Plutonium Subalternative at Idaho National Engineering Laboratory, Argonne National Laboratory-West

Category	Annual Average Volume Generated From Construction (m ³)	Annual Volume Generated From Operations (m ³)	Annual Volume Effluent From Operations (m ³)
Transuranic			
Liquid	None	0.004 ^a	None
Solid	None	2	1 ^b
Mixed Transuranic			
Liquid	None	None	None
Solid	None	1	1
Low-Level			
Liquid	None	0.79 ^a	None
Solid	None	500	250 ^b
Mixed Low-Level			
Liquid	None	0.015	0.015
Solid	None	27	27
Hazardous			
Liquid	5.7	0.15	0.15
Solid	23	1	1
Nonhazardous (Sanitary)			
Liquid	4,000 ^c	7,600	None
Solid	34 ^d	240	120 ^b
Nonhazardous (Other)			
Liquid	Included in sanitary	Included in sanitary	None
Solid	Included in sanitary	310 ^e	None

^a Liquid TRU waste and LLW would be treated with the remaining sludge being solidified.

^b Assumes compaction factor of 4:1 for compactible solid TRU waste, low-level, and nonhazardous waste.

^c Does not include groundwater dewatering, if required.

^d Includes concrete and 6.3 t of steel construction waste material that would be recycled as scrap metal.

^e Recyclable wastes.

Source: IN DOE 1996a.

Table E.3.1.1-3. Estimated Waste Volumes for the Upgrade Without Rocky Flats Environmental Technology Site Plutonium or Los Alamos National Laboratory Plutonium Subalternative at Pantex Plant

Category	Annual Average Volume Generated From Construction (m ³)	Annual Volume Generated From Operations (m ³)	Annual Volume Effluent From Operations (m ³)
Transuranic			
Liquid	None	None	None
Solid	None	0.8	0.8
Mixed Transuranic			
Liquid	None	None	None
Solid	None	None	None
Low-Level			
Liquid	None	0.08 ^a	None
Solid	None	138	69 ^b
Mixed Low-Level			
Liquid	None	0.2	0.2
Solid	None	8	8
Hazardous			
Liquid	Included in solid	1	1
Solid	0.05	1.5	1.5
Nonhazardous (Sanitary)			
Liquid	3,130 ^c	12,900	12,900
Solid	1.3 ^d	275	138 ^c
Nonhazardous (Other)			
Liquid	Included in sanitary	Included in sanitary	Included in sanitary
Solid	Included in sanitary	344 ^e	None

^a Liquid LLW would be treated with the remaining sludge being solidified.

^b [Text deleted.] Assumes compaction factor of 4:1 for compactible solid LLW and nonhazardous waste.

^c [Text deleted.] Does not include groundwater dewatering, if required.

^d Includes concrete and 0.18 t of steel construction waste material that would be recycled as scrap metal.

^e Recyclable wastes.

[Text deleted.]

Source: PX MH 1994a.

Table E.3.1.1-4. Estimated Waste Volumes for the Upgrade Alternative at Y-12 Plant

Category	Annual Average Volume Generated From Construction (m ³)	Annual Volume Generated From Operations (m ³)	Annual Volume Effluent From Operations (m ³)
Transuranic			
Liquid	None	None	None
Solid	None	None	None
Mixed Transuranic			
Liquid	None	None	None
Solid	None	None	None
Low-Level			
Liquid	None	0.04 ^a	None
Solid	8 ^b	3	2 ^c
Mixed Low-Level			
Liquid	None	0.02	0.02
Solid	None	0.8	0.8
Hazardous			
Liquid	None	Included in mixed LLW	Included in mixed LLW
Solid	None	Included in mixed LLW	Included in mixed LLW
Nonhazardous (Sanitary)			
Liquid	1,010	0.8	0.8
Solid	5 ^d	31	15 ^c
Nonhazardous (Other)			
Liquid	Included in sanitary	0.8	0.8
Solid	Included in sanitary	0.8	0.8

^a Liquid LLW would be treated with the remaining sludge being solidified.

^b Includes concrete and 3 t of steel which is contaminated.

^c [Text deleted.] Assumes compaction factor of 4:1 for compactible solid LLW and nonhazardous waste.

^d Includes concrete and 1.5 t of steel construction waste material that would be recycled as scrap metal.

Source: OR MMES 1996a.

Table E.3.1.1–5. Estimated Waste Volumes for the Upgrade With All or Some Rocky Flats Environmental Technology Site Plutonium or Los Alamos National Laboratory Plutonium Subalternative at Hanford Site

Category	Annual Average Volume Generated From Construction (m ³)	Annual Volume Generated From Operations (m ³)	Annual Volume Effluent From Operations (m ³)
Transuranic			
Liquid	None	None	None
Solid	None	21	21
Mixed Transuranic			
Liquid	None	None	None
Solid	None	None	None
Low-Level			
Liquid	None	0.08 ^a	None
Solid	None	89	45 ^b
Mixed Low-Level			
Liquid	None	None	None
Solid	None	5	5
Hazardous			
Liquid	0.2	0.57	0.57
Solid	1.4	4	4
Nonhazardous (Sanitary)			
Liquid	5,880 ^c	8,780	None
Solid	37 ^d	967	483
Nonhazardous (Other)			
Liquid	Included in sanitary	Included in sanitary	None
Solid	Included in sanitary	None	None

^a Liquid LLW would be treated and solidified prior to disposal.

^b Assumes compaction factor of 4:1 for compactible solid LLW and nonhazardous waste.

^c Does not include groundwater dewatering, if required.

^d Includes concrete and 4.4 t of steel construction waste material that would be recycled as scrap metal.

[Text deleted.]

Source: HF DOE 1996a.

Table E.3.1.1-6. Estimated Waste Volumes for the Upgrade With All or Some Rocky Flats Environmental Technology Site Plutonium and Los Alamos National Laboratory Plutonium Subalternative at Idaho National Engineering Laboratory, Argonne National Laboratory-West

Category	Annual Average Volume Generated From Construction (m ³)	Annual Volume Generated From Operations (m ³)	Annual Volume Effluent From Operations (m ³)
Transuranic			
Liquid	None	0.004 ^a	None
Solid	None	2	1 ^b
Mixed Transuranic			
Liquid	None	None	None
Solid	None	1	1
Low-Level			
Liquid	None	0.79 ^a	None
Solid	None	500	250 ^b
Mixed Low-Level			
Liquid	None	0.14	0.14
Solid	None	27	27
Hazardous			
Liquid	6.3	1.3	1.3
Solid	26	1	1
Nonhazardous (Sanitary)			
Liquid	6,100 ^c	10,300	None
Solid	49 ^d	346	173 ^b
Nonhazardous (Other)			
Liquid	Included in sanitary	Included in sanitary	None
Solid	Included in sanitary	440 ^e	None

^a Liquid TRU waste and LLW would be treated with the remaining sludge being solidified.

^b [Text deleted.] Assumes compaction factor of 4:1 for compactible solid TRU, low-level, and nonhazardous waste.

^c Does not include groundwater dewatering, if required.

^d Includes concrete and 8 t of steel construction waste material that would be recycled as scrap metal.

[Text deleted.]

^e Recyclable wastes.

Source: IN DOE 1996a.

Table E.3.1.1–7. Estimated Waste Volumes for the Upgrade With Rocky Flats Environmental Technology Site Plutonium Pit Subalternative at Pantex Plant

Category	Annual Average Volume Generated From Construction (m ³)	Annual Volume Generated From Operations (m ³)	Annual Volume Effluent From Operations (m ³)
Transuranic			
Liquid	None	None	None
Solid	None	0.8	0.8
Mixed Transuranic			
Liquid	None	None	None
Solid	None	None	None
Low-Level			
Liquid	None	0.08 ^a	None
Solid	None	138	69 ^b
Mixed Low-Level			
Liquid	None	0.2	0.2
Solid	None	8	8
Hazardous			
Liquid	Included in solid	1	1
Solid	0.05	1.5	1.5
Nonhazardous (Sanitary)			
Liquid	3,130 ^c	12,900	12,900
Solid	1.3 ^d	275	138 ^e
Nonhazardous (Other)			
Liquid	Included in sanitary	Included in sanitary	Included in sanitary
Solid	Included in sanitary	344 ^f	None

^a Liquid LLW would be treated with the remaining sludge being solidified.

^b [Text deleted.] Assumes compaction factor of 4:1 for compactible solid LLW.

^c [Text deleted.] Does not include groundwater dewatering, if required.

^d Includes concrete and 0.18 t of steel construction waste material that would be recycled as scrap metal.

^e Assumes a compaction factor of 4:1 for compactible solids.

^f Recyclable wastes.

[Text deleted.]

Note: Waste volumes for the Upgrade with All or Some RFETS and LANL Pu material are bounded by the Consolidation Alternative Modifying Existing and Constructing a New Facility in Zone 12 South at Pantex Plant (Table E.3.1.2–5).

Source: PX MH 1994a.

Table E.3.1.1-8. Estimated Waste Volumes for the Upgrade With Rocky Flats Environmental Technology Site Non-Pit Plutonium Subalternative at Savannah River Site

Category	Annual Average Volume Generated From Construction (m ³)	Annual Volume Generated From Operations (m ³)	Annual Volume Effluent From Operations (m ³)
Transuranic			
Liquid	None	None	None
Solid	None	None	None
Mixed Transuranic			
Liquid	None	None	None
Solid	None	None	None
Low-Level			
Liquid	None	None	None
Solid	None	None	None
Mixed Low-Level			
Liquid	None	None	None
Solid	None	None	None
Hazardous			
Liquid	Included in Solid	None	None
Solid	0.33	0.56	0.56
Nonhazardous (Sanitary)	1,680 ^a	1,490 ^b	1,480
Liquid	4.5 ^c	13	11 ^d
Solid			
Nonhazardous (Other)			
Liquid	Included in sanitary	Included in sanitary	Included in sanitary
Solid	Included in sanitary	13 ^e	None

^a [Text deleted.] Does not include groundwater dewatering, if required.

^b Assumes a 350:1 wastewater/sludge ratio in the treatment of liquid sanitary waste.

^c Includes concrete and 2.3 t of steel construction waste material that would be recycled as scrap metal.

^d Includes sludge (5 m³) from sanitary treatment which goes to land applicator. Compactible solids compacted by a factor of 4:1.

^e Recyclable wastes.

Source: SR DOE 1994e; SRS 1996a:4.

Table E.3.1.1–9. Estimated Waste Volumes for the Upgrade With All or Some Rocky Flats Environmental Technology Site Plutonium and Los Alamos National Laboratory Plutonium Subalternative at Savannah River Site

Category	Annual Average Volume Generated From Construction (m ³)	Annual Volume Generated From Operations (m ³)	Annual Volume Effluent From Operations (m ³)
Transuranic			
Liquid	None	None	None
Solid	None	None	None
Mixed Transuranic			
Liquid	None	None	None
Solid	None	None	None
Low-Level			
Liquid	None	None	None
Solid	None	None	None
Mixed Low-Level			
Liquid	None	None	None
Solid	None	None	None
Hazardous			
Liquid	Included in solid	None	None
Solid	0.5	0.8	0.8
Nonhazardous (Sanitary)			
Liquid	2,370 ^a	1,806 ^b	1,800
Solid	19 ^c	18	14 ^d
Nonhazardous (Other)			
Liquid	Included in sanitary	Included in sanitary	Included in sanitary
Solid	Included in sanitary	18 ^e	None

^a [Text deleted.] Does not include groundwater dewatering, if required.

^b Assumes a 350:1 wastewater/sludge ratio in the treatment of liquid sanitary waste.

^c Includes concrete and 2.3 t of steel construction waste material that would be recycled as scrap metal.

^d Includes sludge (5 m³) from sanitary treatment which goes to land applicator. Compactible solids compacted by a factor of 4:1.

^e Recyclable wastes.

Source: SR DOE 1994e; SRS 1996a:4.